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manner with other points until the line $C o G$ (Fig. 7) and $C L o G$ (Fig. 8) is obtained.

To find the covering of the frustum of a cone, the section being made by a plane perpendicular to the axis :

Let $A C E F$ (Fig. 9) be the generating section of the frustum. On $A C$ describe the semicircle $A B C$, and produce the sides $A E$ and $C F$ to D . From the centre D , with the radius $D C$, describe the arc $C H$; and from the same centre, with the radius $D F$, describe the arc $F G$: divide the semicircle into any number of equal parts, and run the same divisions along the arc $C H$; draw the ordinates to the semicircle through the points of division, at right angles to, and meeting $A C$; and from the points $o n m$, etc., where these ordinates cut the line $A B$, draw lines to the point D ; and from the last division in the arc $C H$ draw also a line to the point D ; then shall $C H G F$ be half the development of the covering of the frustum $A C F E$.

To find the covering of the frustum of a cone the section being made by a plane not perpendicular to the axis :

Let $A C F E$ (Fig. 10) be the frustum. Proceed as in the last problem to find the development of the covering of the semicone: then, to determine the edge of the covering on the line $E F$. From the points $p q r s t$, etc., draw lines perpendicular to $E F$, cutting $A C$ in $y x w v u$; and the length $u t$ transferred from 1 to a , $v s$ transferred from 2 to b , and so on, will give $a b c d e G$, points in the edge of the covering.

We have now arrived at that stage where we can bring before the student, practical examples of works in carpentry and joinery, and in our next we intend to do so, giving such lines as may be necessary to give a clear idea of how the work should be executed.

If the reader has followed the papers on this subject closely, he will have no difficulty in comprehending what follows.

The Sectorian System of Hand-Railing.

EIGHTH PAPER.

Plate 58.

SECTION 2.—This section shows a stair, with winders in the quadrant, with a radius of two feet in the turning. Where the space is sufficient, a very imposing structure can be raised, giving character and effect to all the surroundings if all are in keeping, which of course, in such a building, would be the case.

Suppose the newel to be twelve inches at the base, the rail six inches wide, well moulded—the balusters three inches in diameter at the base, steps four or five feet long, the ends handsomely finished with nosings at least one and a half inches thick, the string faced with

a handsome bracket, then a large niche in the angle, with a fine piece of statuary as an ornament. I know of no conception in character to equal it. The grandest sort of stairs can be built after this plan.

Fig. 1 shows the plan with the quarter wreath all in one piece, by working from the tangents a and b . If it is found desirable to have the wreath in two pieces, then the dotted lines show the angle of the tangents to be used. The height of two and a half instead of five risers will be the height for each piece.

Having laid down the plan, proceed to obtain the whole length wreath. Take the bevel and obtain the tangents from the sector, as applied at a, b , Fig. 1, on the rake, and draw the lines, a, b , Fig. 2; get the length, and lay off width of rail, to describe circle of wreath; stick pins at the points c, d, e, f , and with long blade bevel, each blade pressing against the pins, with pencil in the angle, strike the circle, g, h , Fig. 2, to equal g, h , Fig. 1.

Fig. 3 is the lower wreath, and procured as before described.

Fig. 4 shows the ramp from flyer to winder.

Section 2 shows the plan of the commencement of a grand stairway intended for a large hall of a first-class house.

Fig. 1 is the plan of newel, cap, curved steps and risers, balusters, etc. I have not given the mode of curving the risers, supposing that any one sufficiently skilled to construct a stairway would certainly know how to bend a riser.

Fig. 2 is the starting wreath-piece, and is obtained in the way given in preceding notes, and needs no further explanation on this plate.

Fig. 3 is a side view of Fig. 1, showing section of cap and elevation of rail. The falling moulds for the wreath are obtained as laid down in preceding plates, to which reference must be had for further instruction.

To obtain the spring and plumb bevels, resort must be had to the sector, and proceed as laid down in former plates, having one leg of tangent bevel horizontal, and the other on a rake of the flyer; then apply the small bevel in the usual way on both leaves of the sector. As it will be seen, that by one leg being placed horizontal and the other on the rake of the flyer the spring and plumb are not the same angle.

Correspondence.

WE invite communications from our readers in matters connected with the trades we represent. Be brief, courteous, and to the point.

Editor of the Wood-Worker:

THE eleven packages received all right. I am well satisfied with them. The WOOD-WORKER is so good a publication that I would

like to see it published weekly if you could only see your way clear to do so. I am sure there are thousands of men who work in wood in this country who would be willing to pay three or four dollars a year for your paper if they could get it weekly. I would like to hear the opinions of some of my brother readers on this question.

JOHN RANDOLPH.

DETROIT, July 12th, 1879.

Intercommunication.

This department is intended to furnish, for the benefit of all our readers, practical information regarding the art of manipulating wood by hand or machinery; and we trust that every reader of our paper will make the fullest use of it, both in asking and answering. All persons possessing additional or more correct information than that which is given relating to the queries published, are cordially invited to forward it to us for publication. All questions will be numbered, and in replying it will be absolutely necessary, in order to secure due insertion, that the NUMBER and TITLE of the question answered should be given; and in sending questions, the title of key-words of the question should be placed at the head of the paper. Correspondents should in all cases send their addresses, not necessarily for publication, but for future reference. We also request that all questions or answers be written on separate slips of paper, and addressed to the Editor. Notes of practical interest will be welcome at all times. When drawings are sent to illustrate answers to questions, or for full pages, they should be on separate slips, and should be drawn in ink on clean, white paper. Short questions, requiring short answers, may be asked and answered through the agency of postal cards.

When answers to questions are wanted by mail, the querist must send a stamp for return postage.

Queries.

52. HIGH BUILDINGS.—Will you please give me, through your paper, the names and height of some of the loftiest buildings in the world?—ASPIRE.

53. BLACKBOARD.—I should be very much pleased if some kind reader would publish in the WOOD-WORKER a receipt for making a blackboard for school purposes.—AMATEUR.

54. PAINT.—I wish to paint the floors of a house; what kind of paint is best to use?—PET.

55. FIRE.—Could you, or any of your readers, give me any information or method by which wood can be made to withstand the action of fire?—VULCAN.

56. WOOD.—What causes wood to decay?—VULCAN.

57. EMBOSSING.—I wish to emboss some wood-work; any information on the subject will be fully appreciated by—WOOD-BUTCHER.

58. SPANDRIL.—I frequently see the word "spandril" used in architectural works; what does it mean?—TYRO.

59. RUBBER.—Can any reader of the WOOD-WORKER inform me how to melt hard, vulcanized rubber? I wish to make moulds for plaster casts, and want to use the rubber

for that purpose. Any information will oblige—PLASTERER.

60. CHAIRS.—When did chairs come into general use, and what constitutes a good one?—EASE.

61. PICTURE FRAMES.—Is it better to use two nails for hanging small pictures than one?—LUCY.

62. ÆOLIAN HARP.—Who invented the Æolian Harp? Isn't it an American invention?—YANKEE.

62. STAIN.—How is satin-wood stained, polished, and finished?—G. H. F.

Answers.

We wish it distinctly understood, that we do not hold ourselves responsible for the accuracy or reliability of answers furnished to this department by our correspondents.

We cordially invite our readers to take an active part in this department, as we are confident that much good can be accomplished by a free interchange of ideas and opinions in regard to subjects connected with the art of wood-working.

Many persons are afraid to write to a public journal because of their lack of literary attainments; to such we would say: Give us your ideas in such language as you can command, and leave the rest to us. It is ideas and opinions we want, such as may be of use to the workman or amateur. Answers should be sent to this office on or before the fifteenth of each month, to insure insertion in the next issue.

43. WREATH.—I for one have never been able to thoroughly understand Plate 10 in Lucius Gould's "Stair-Builder's Guide." I have attempted to construct a rail after the lines shown on the plate several times, but always met with failure. Perhaps it was because I was too dull to comprehend his system.—BEVEL.

45. PLANES.—A. P. G. will find the "rounds and hollows" made by Lindsey Brothers, of Huntington, Mass., as good, if not better, than any other in the market. These planes leave the manufactory all fitted up in good order and ready for use. I have used Bailey's bench-planes; they are good, but I prefer the "Rodier" single iron bench-planes, as they are superior in many respects to the Bailey. I would advise any of your readers who want to buy planes to try a set of "Rodier's patent."—R. M. PORTER.

46. TRADES.—Carpentry is the art of combining pieces of timber for the support of any considerable weight or pressure.

The theory of carpentry is founded on two distinct branches of mechanical science: the one informs us how strains are propagated through a system of framing; the other, how to proportion the resistance of its parts, so that all may be sufficiently strong to resist the strains to which they are exposed. The one determines the stability of position, the other the stability of resistance. Each of these may be considered in the most simple manner the subject admits of, with the addition of rules and practical remarks.